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## VIII.

## SCIENTIFIC SURVEY OF THE STATE OF MASSACHUSETTS.

Read, April 14, 1874.

## MEMORIAL.

TO THE HONORABLE THE GENERAL COURT OF MASSACHUSETTS :

*The American Academy of Arts and Sciences respectfully presents the following Memorial, urging a new and thorough Scientific Survey of the Commonwealth.*

It is now more than forty years since the State of Massachusetts began a survey of its territory, the results of which were published in a series of Reports upon the geology, zoölogy, and botany of the State, with a map and a geological chart. It was the first public survey undertaken in this country, and was followed by similar ones carried on by the other States and by the General Government. Massachusetts has the honor, not only of originating this series of surveys, but of giving to the country a large proportion of the scientific men who conducted those of the other States. The survey was at once of great practical value to the Commonwealth, and a school for scientific education.

The several Reports thus published have been absorbed by the public, and it is now impossible to procure them; the State recognized this fact when it ordered the republication of two of them; and the demand for others of the series suggests the pertinent inquiry whether a simple republication or a revised edition of one and another of the Reports would meet the demands of the people. In the main, the Reports represented fairly the condition of science at the time they were made; but the lapse of one generation has witnessed such progress in the methods of scientific investigation, and such an addition to the store of knowledge, that, though the Reports contain much valuable material, most of them are now incomplete and to some extent antiquated. The time has come when a new survey is necessary, more thorough and comprehensive than the old, as the method and knowledge supplied by science now are in advance of what was at the command of the men of that day.

The State was the first to order a scientific survey, and it should not allow itself to be the last to take advantage of the developments of later study. Within the past few years there has been great activity in many of the States in this direction ; and there have been published, or are in process of publication, Reports which leave ours far behind ; while the surveys undertaken in Europe, even by the smaller and less favored countries, have been much more thorough and systematic than any executed in this country.

The publications of such a survey as is now proposed should embrace a detailed topographical map, on a scale of about an inch to a mile, maps colored to show the distribution of rock-formations and economic minerals, with charts on a larger scale of particular localities, having special interest or importance ; sections and explanatory text to accompany these maps, embracing descriptions and analyses of the rocks and ores and of the waters, and investigations into the strength and durability of our building-stones ; full descriptions and truthful illustrations of the animals and plants, including their natural history, transformations, and relations to man and his requirements.

In carrying out the survey, the State could take advantage of the provision made by Congress, by which any State undertaking a topographical survey of its territory is empowered to call upon the United States Coast Survey to make the preliminary triangulations ; so that the State is at once relieved of a very important part of the work to be done. In making these triangulations, the Coast Survey utilizes the experience of local Professors and their students ; and in the same way it would be entirely feasible, in following the trigonometrical with the topographical survey, to employ the services, in different parts of the State, of the same persons. The survey would thus become at once a most valuable auxiliary to scientific education, by giving the younger men in our schools of science and technology an opportunity to put their studies to practical use.

The material interests of the State call urgently for this survey. A detailed topographical map on the scale above indicated, accompanied by tables representing the land-slopes and the areas of the river bottoms, would be of great value in guiding plans of public or local improvement. The extension of the rocks of the Rhode Island coal-field into our State makes it important to decide once for all the question whether these rocks contain coal-seams of economic value. It may reasonably be expected that new industries would be seen to be practicable, and experience has shown that an important result of such surveys is to prevent the waste of capital and labor in unfruitful en-

deavors, as well as to direct where industries will best flourish ; more advantageous methods of carrying on present enterprises would be established, and our natural resources economized ; as a single illustration, the results already reached by the appointment of fish-commissioners may be cited.

But the survey is urged on a still higher ground. The education of its citizens has always been the cherished aim of Massachusetts. There is no society of scientific men within the limits of the State, no educational institution, that can do what lies simply within the power of the Commonwealth to effect : namely, to furnish old and young, and especially those receiving a common-school education, with the means of acquiring a precise and thorough knowledge of nature, as manifested in the familiar objects about them. To this end your memorialists urge that the Reports under the proposed survey should, as far as possible, be prepared with special reference to an intelligent use by the people ; and that, instead of being distributed gratuitously, they should be sold through the ordinary agencies at a slight advance upon the cost, so as to enable the State to pay the authors from the proceeds of the sales, and to recover the greater part of its original outlay, without placing the books beyond the reach of persons of moderate means. Such a mode of publication would unquestionably be the most economical for the State, and the most certain to bring the books directly and naturally into the hands of those who would value and use them.

(Signed),      CHARLES FRANCIS ADAMS, *President.*

JOSIAH P. COOKE, Jr., *Corresponding Secretary.*